

Aco: Sept 29th
Ans Oct 6th

New York September 25th 1854

Dr George Engelmann.

Dear Sir

I am in receipt of your favor of 17th inst. and thank you for the suggestions and met. observations which it contains.

In regard to the "important atmospheric changes which appear like huge waves progressing from west to east" and which may often be traced from the Rocky mountains to the coast,^{near} and that they are identical with the northers of Mexico, the results of your inquiries agree with mine. I am led to believe however, that that these changes are as truly cyclonic, in their essential character, as those of the atlantic storms, which often visit this region.

In New York we are made subject to both classes of these phenomena, if indeed they be different in their essential elements. But the laws which govern these phenomena do not appear to me as different, and capable of division. You will perceive from my last paper, a pamphlet copy of which I now send you, that the apparently wave-like progress from west to east in these latitudes, may be traced entirely across the atlantic in the principal case which is there presented: - a greater distance than from the Rocky mountains to Boston. And yet, the core or nucleus of this huge cyclone travelled undoubtedly on a course which is diagonal to this apparently eastern progression.



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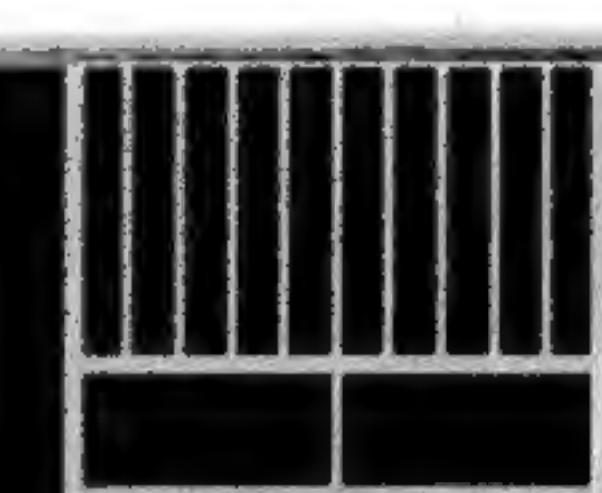
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It appears however that the lower winds of the great cyclones which sweep over the interior of the continent are less regular or symmetrical and the winds of inversion on the left of its axis path less noticeable than on the ocean: owing to the obvious conditions of the case, and mostly to the fact that continental examinations are mostly confined to the right side of the cyclonic path.

The observations you send me, which are more thorough than my own, are of great interest, as they enable me to trace more satisfactorily the progress and character of the double cyclone or rather the two simultaneous cyclones by which the great change from the heat ^{and dryness} of summer to the temperature of autumn was induced. The most western of these cyclones, which set in with you on the 7th ^{showed} and its nearest approximation of center, on the morning of 9th and without rain, first reached us on the 8th and its center approximated late in the afternoon of 9th, the winds on that day three points more southerly than with you on the 8th, showing that our position was even more to the right of its axis path than yours. Its near bar. max. was with you on morning of 10th, but with us was indeterminate, from a cause which follows. The sky was partially cloudy ^{the} on the 9th ~~with~~ no rain, and a scorching sensation of heat, from the great plains of the southwest.



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On the night of ninth the left margin of the coast storm or great hurricane of the Atlantic (probably not inferior to that of Sept. last year) interposed beneath the overland cyclone, bringing with it a portion of the temperature and ice-chill of the great boreal current which washes our eastern shores. This sudden transition from the warm right limb of one vast cyclone to the chilly left limb of another which was even more fresh from the tropical latitudes, was one of the most marked and decided changes from summer heat and dryness to autumnal temperature and rains, which I have ever noticed.

The cyclone of 5th Jan. last, which approximated to you on that day with its western margin, at Ft. S. Bar amie, was with us, ^{late} on the night of 6th (bar. unmarked) and its rear side on the 7th bar. 30.45 therm. 17°, cloudy & fog, but no rain or snow. On the Brazos, Texas, (lat 30.30 long 96) a strong ^{at this period} Norther, the cold setting in at 10.30 a.m. of 5°.

your nearest central approximation ^{in cyclone} of Jan. 15 reaches us on the 16th. with ^{some} rain & snow. Its receding margin on morning of 18th therm. 31° Bar. 30.36 at sunrise.

your central approximation of Jan. 20th. reached us about midday of 21st bar. 29.60 therm. 49°. The receding margin of this cyclone left us on the ~~morning~~ ^{afternoon} of 22nd, bar. at 2pm 30.55^{therm. 22°}.

On the night of 22nd and during 23rd the right limb of another cyclone passed over us and on the morning of 24th the therm. sank to 10[°]. It ^(then) was 14° at sunrise of 22nd and 19° at 23rd.



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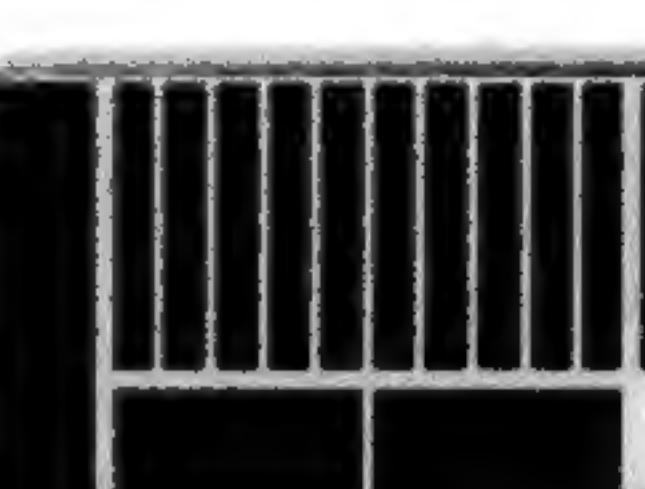
I enclose herewith a copy of my journal of 6th to 11th of the present month. It is roughly kept, but will suffice for comparing our phenomena with yours. If I had opportunity for effected labor in this department I would be glad to accept your kind offer of further materials, as it is I shall feel obliged for your present kindness, and still further if you can furnish me with your observations from 5th to 9th of June last, at which period I was on the upper Mississippi during the transit of a cyclone of decided strength and character, which reached this region on the day following. Any notices of this from points west of St. Louis will also be gratefully received.

I have lying on hand some unfinished labor on the storm which occurred between Oct 11th and 14th 1846, regarding which your observations ^{at St. Louis} would be of interest.

yours truly

W. B. Redfield

W. B. R.



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1854

Date	M.	H.	A.M.	Barom.	Winds	Strength	Clouds from	Blooming 0 to 10	Remarks
Wednesday, 6	6	78		J.W.	Moderate	N.W. east.	W.S.W. away	5	A strong & dry cyclone commences to night. At 10 p.m. a third low storm said flying from 35°W at the estimated rate of 60 or 70 miles per hour: over this is a "mackerelled" stratum of loose cirro cumulus moving moderately from W by S.
	10	79	78	30.16	"	"	"	5	
	2				"	"	"		
	6	80	.04		"	"	"	3	
	10	81	79	.06	"	"	"		
	6	76	78	.08	J.W.	"	J.W. east. S to SW away	2	
Thursday, 7	10	78	79	11	W.W. - NW	"	"	3	Estimating 3000 or 3500 ft from the earth.
	2				N.W.	"	"	6-	
	6	85	80	09	N.W.	light	"		
	10	76	78	19	"	"	"	0	
	6	69	76	22	"	"	W.W. east.	0	
	10	73	76	23	" - SW	"	"	1	
Friday, 8	2				S - SSE	mod.	"	3	From 10 p.m. to 6 a.m. heat increased one degree in my sleeping room with open windows & 3 deg. out of doors. This will not be ascribed to solar influence.
	6	78	78	12	"	"	"	5	
	10	76	77	07	"	fresh	W by S west. S.S.W. (swiftest)	5	
	6	79	78	29.96	J.W. by W	"	W by S. east. 6-10-4 S.W. by W. (swiftest)	3	
	10	82	79	95	"	Strong	"	10-5	
	2	80	88	"	" - Mod	"	"	6-10	
Saturday, 9	6	84	79	87	"	"	"	10	Sept. 10. A cold N.E. wind. storm and gale set in during last night, driving last night, during last night, which apparently is a new and distinct cyclone from that of yesterday.
	10	81		N.E.	- Strong gale in night - W.	"	"	10	
	6	63	77	94	"	Gale	E.N.E. winds	10	
	10	61	75	95	"	"	"	10	
	2	60	74	88	" - N.E.	Strong	"	10	
	6	58	73	92	N.E. to N	"	(windiest)	10	
Sunday, 10	10	57	72	30.02		Mod.	"	10	Sept. 10. A cold N.E. wind.
	6	52	71	16	N.W.E.	"	S air at 3		
	10	60	81	22	variable	"	" sandstorms 4-8		
<i>By W. C. Redfield N.Y. city.</i>									

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Rec'd March 10
Redfield

New York ~~March~~ ^{March} February 5 1855

My dear Sir,

I thank you for your kind letter of Feb. 22. and for the met. records which it contains; and greatly wish that you would pursue the inquiry in relation to the two cases thus presented. I regret to say that I even omitted to preserve the extensive telegraphic comparisons which were printed in the "Tribune" & "Times" of this city, (for the most part,) and until they were unfortunately destroyed.

I send you my imperfectly kept records for the same periods; and will here notice that the bar. max. which immediately preceded the first cyclonic period occurred at New York on the morning of Jan. 17th. This overland cyclone appears well worthy of further investigation. The report from San Antonio is interesting and I suppose must refer to the post minimum bar. period of the cyclone. The time, if correctly reported as the beginning of the "norther," would seem to be later, in proportion to St Louis, than is common.

Our severe cold of Feb 6-7 was probably connected with the cold ending of one cyclone & the beginning of another, progressing in the track of our coast storms, which do not reach the western states. But the immediate source & progression ^{the local} _{in this particular case} of the cold, is doubtless found in the NW & N.E. winds (principally the former) which brought the subarctic cold air to us direct from



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Canada and the basin of the St. Lawrence. This seemingly natural progression of the cold appears rather to be the exception than the rule, in the severe winter weather of N.Y. & New England, and occurs in marked distinctness two or three times in a winter: but more often the regular cyclonic progression of reduced temperature is decidedly from the westward & southwestward: sometimes passing out to the Atlantic without fairly getting so far north as Boston.

The cyclones which pass over Arkansas & Missouri must probably have Mexican rather than Californian relations, and I am glad that you so fully recognise the distinctions and obstructions pertaining to aerial currents or horizontal movements, necessarily of but limited vertical dimensions or thickness. But as the cyclones which are found on the West coast of N. America, north of Lat. 25°, ~~strike~~ ^{strike} perpendicularly to the line of coast, I see not how they can avoid affecting the temperatures & changes which occur east of the Coast Range and of the Sierra Nevada and even ~~of~~ the Rocky Mountains. Indeed it is probable that the most common overland cyclones, in the far west, enter the basin of the Colorado by the Californian gulf and thus ^{mainly, or principally,} avoid the obstruction afforded by the two ranges just mentioned. The hygrometric



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conditions and visible phenomena of any cyclone passing from the Pacific ocean over the interior of the Am. continent would doubtless be ~~greatly~~
modified; and their features, ^{in the interior of the continent,} would hardly be recognized by our nautical friends.

Wishing you health and zeal for an extensive prosecution of these important inquiries I am dear sir

truly yours
Wm. C. Redfield

To George Engleman.



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Cloudiness

0 to 10

1855	Mo	Thur	Fri	Sat	Sun	Mon	Tues	Weds	Cloudiness	Remarks
	Alt	Barron	Kinds	Strength	Clouds from					
<i>January</i>										
Wednes.	17	6	29	56	30. 25	E N E	Moderate	WSW	10	
+	10			25	max. 2 by N	"	"	"	10	
	21			21	8 N E	"	"	"	10	
	6					"	"	"	10	
	10	35	67	13		"	"	"	10	
	10	35	65	09		"	"	"	10	
Thurs.	18	6	38	58	29. 87	S W	light	SSW	10	misty
	10					WSW	"	" east.	9	
	2					" - NW	mod.	" "	2	
	6	38	65	76		"	"	"	2	
	10	34	63	77		"	"	"	0	
Fri.	19	6				"		NNW	0-	
	10	32	63	68	NNW	Fresh - Strong	"	"	3	
	2					Strong	"	"	6	
	6	32	65	73		"	"	"	2	
	10	30	65	70		fresh - mod.	"	"	0	
Sat	20	6	25	57	80	W by S.	mod	WSW by SW	2	
	10	29	64	83	WSW	fresh	WSW	"	10	
	2		63	86	SW	"	"	"	9	
	6	32	63	85	"	"	"	"	10-	
	10	30	64	93		"	"	"	0	
Sun.	21	6	31	50	30. 00	N E	mod.	"	10	
	10	62	03	"		"	"	"	10	Rainy
	2			"		fresh	"	"	10	"
	6	34	62	29	86	"	"	"	10	Rain
	10	36	66	> 74	- S or SE	Gale	"	"	10	"
Mon.	22	6	52	57	> 33 min.	S. - SSW	Strong	SSW	10	
	10	48	65	40	SW -	"	SSW	S. east.	8-5	
	2				WSW	"	SSW	SW. east.	7	
	6	29	64	88	W	"	"	"	2	
	10	27	68	30. 00	"	"	"	"	4	
Tues.	23	6	20	55	16	"	fresh	"	0	
	10	22	60	27	"	strong	WNW	"	-1	
	2			"		"	"	"	0	
	6	24		26	"	fresh	"	"	0	
+	10	23	62	29 max.	"	"	"	"	0	

Jan 26th A cyclone with wind from E N E to S during its access & bar, falling to 29.22 at 4 pm, while a fearful gale W b N is reported on the Illinois prairies.
and changed to W. b.



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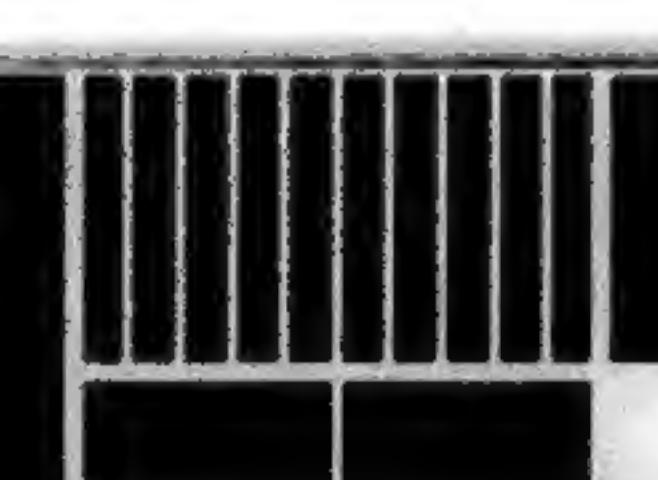
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1855. Hourly Observations at the Observatory							Clouds	Cloudiness
				Wind	Strength	Clouds		
Feb. 4	6	10 48	29.97	West	weak		0-3	
	10	14 57	30.00	"	"		5	
	2			"	"		6	
	6	18 60	29.94	"	"		7	
	10	18 61	90		Mod.		10	Snow
mond 5	6	18 49	65	NNE	"		10	"
	10	20 58	70	NEVV	fresh		10-4	
	2			NW	"		0	
	6	20		"	"		0	
	10	13 59	82	"	"		0	
Tues. 6	6	3 44	98	NNW	"		0	
	10	6	30(?)	"	"		0	
	2			"	"		1	
	6	0 52	30.18	"	"		0	
	10 - 6	54	24	"	"		0	
Wednes 7	6 - 6	38	30	N8	Mod.-fresh	WNW and 9-10		
	10 - 2	50	35	"	Strong		10	
	2 + 8	50	20	"	<u>gale</u>		10	
	6	9 52	11	"	"		10	
	10	13 52	00	"	Strong		10	
Thurs 8	6	18 44	29 80	"	"		10	Snow
	10		76	"	"		10	"
	2	24 50		"	"		10	"
	6	26		"	fresh		10	
	10	25 50	70		"		10	
Frid 9	6	22			Mod		10	
	10	55	80		"		10	
	2				"		10	
	6	27 55	86		"		10	
	10	23 53	30 00		"		10	
Sat. 10	6	15 48	12		"		10	
	10	18 57	22		light		0	
	2	59	19		"		0	
	6	22 58	21		"		0	
	10	17 57	24		"		0	



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